These are the primary figures I was thinking of. I have another before and after sediment figure I will look for as well.

can be rigorously documented. Other commonalities among the projects is that in both cases, rigorous post removal confirmation sampling programs were implemented to insure that not only were design elevations met, but target remedial action limits (RALs) were achieved. Finally in both cases post removal residual contamination was managed using a combination of sand covers and engineered caps at the Fox River in Wisconsin and backfilling with clean sand at Bryant Mill Pond, in Michigan.

These successful projects provide a site specific conceptual model to identify the types of remedial actions that should be considered, as well as for predicting the nature of the response that can be expected should similar remedial actions be selected for parts of Area 1.

2.1.1   Bryant Mill Pond

The pre-TCRA SWAC within the BMP was 32 mg/kg and the post TCRA SWAC was 0.26 mg/kg, representing a reduction of approximately two orders of magnitude. Concentrations of PCBs in surface water also declined by approximately two orders of magnitude and PCBs in fish tissue declined by approximately one order of magnitude[1] in response to the TCRA (Figure 1). These declines in fish and water PCB concentrations were larger than would have been expected, absent the removal and accelerated times to recovery of fish tissue concentrations by decades. MDEQ long term monitoring data show that these reductions in fish tissue PCB concentrations have been maintained in both carp and whole-body white suckers since the 1998/1999.

The overall approach taken in this report is to develop statistically reliable empirical relationships between fish tissue PCBs and sediment and water, as well as statistically reliable relationships between fish tissue PCBS and time which can be used to:

1) predict the response of fish tissue PCB concentrations associated with changes in SWAC, followed by
2) project future fish tissue PCB concentrations that can be compared with selected risk based thresholds.

These analyses are accompanied by statistical evaluation of uncertainties in estimates of effectiveness and as forward temporal projections of PCB concentrations. These uncertainty bounds provide risk managers understanding of the reliability of projected remedial effectiveness.

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[1] Commonly used methods for modeling PCB accumulation rates from sediment are usually based on biota to sediment accumulation factors (BSAFs) which rely on an assumption linear relationship between PCB concentrations in fish tissue and sediment and or water. The results at Bryant Mill Pond suggest that changes in fish tissue PCB residues were not linearly related to changes in sediment or water concentrations. Subsequent analysis of accumulation rates discussed in this report will show that PCBs in fish are better predicted by a power function of PCB concentrations in sediment of the form, $C_{Fish} \propto C_{Sediment}^{\beta}$ and that the decline actually observed at BMP is better predicted by this power function than the BSAF.
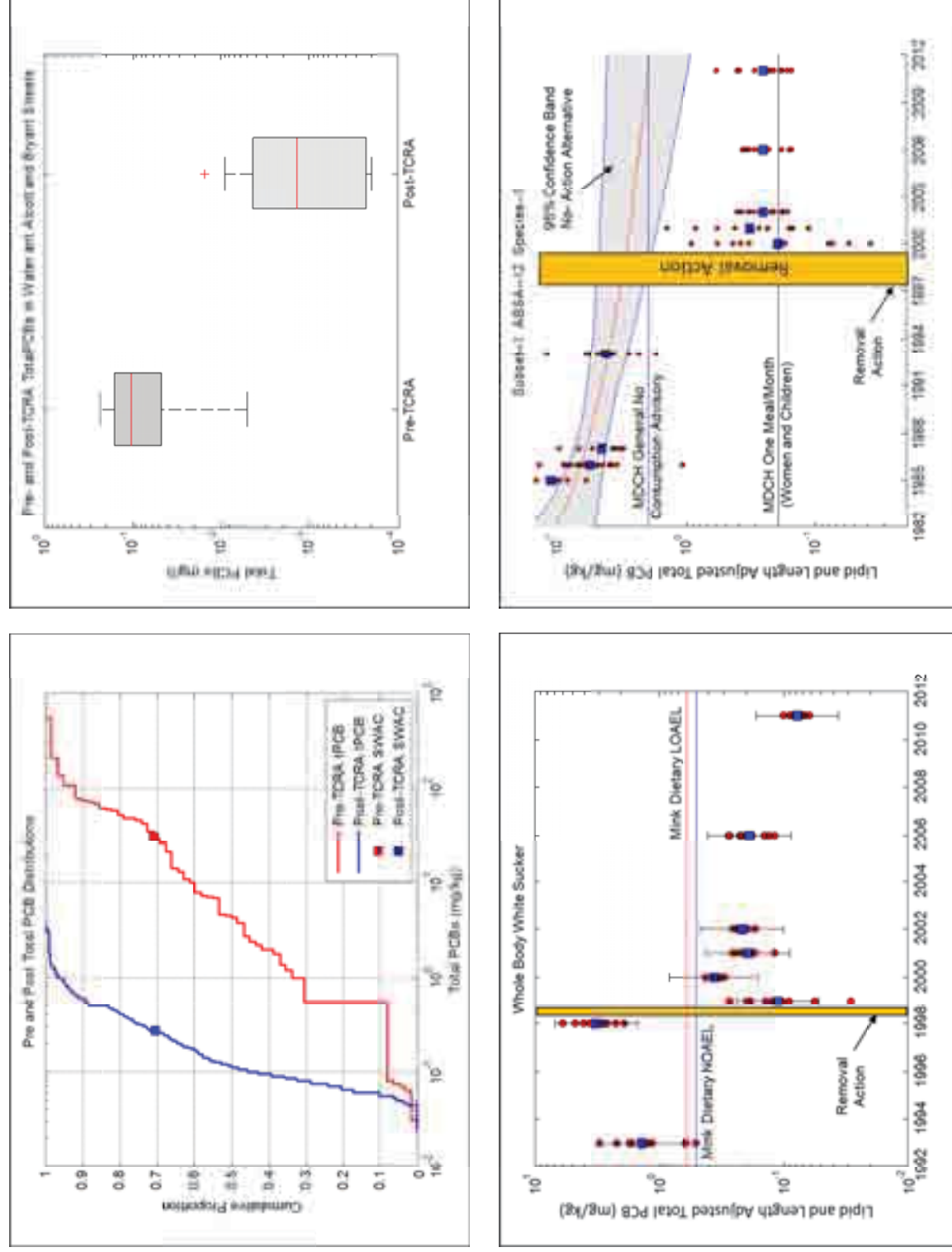
Figure 2.2-1. PCB concentration in sediment (upper right), water (upper left), whole body white suckers (lower left) and common carp (lower right) in response to removal action.